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AS

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/498,336 02/04/00 SHIELDS

J 52352-372

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IM22/0323

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EXAMINER

McDermott Will & Emery
600 13th Street N W
Washington DC 20005-3096

PEREZ RAMOS, V

ART UNIT	PAPER NUMBER
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1765

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DATE MAILED:

03/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/498,336

Applicant(s)

SHIELDS ET AL.

Examiner

Vanessa Perez-Ramos

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____

- 18) ☐ Interview Summary (PTO-413) Paper No. ____
- 19) ☐ Notice of Informal Patent Application (PTO-501) Paper No. ____
- 20) ☐ Other: ____

DETAILED ACTION

Specification

1. It is requested that Applicant updates the following "Related Application Information" on page 1, lines 1-5: "...U.S. Patent Application Serial No. _____ filed on _____".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kepler (U.S. 6046104) in view of Solis (U.S. 5851302).

In regard to claims 1, 12 and 14, Kepler discloses a method comprising: forming a first dielectric layer on a substrate (col. 1, line 47); forming a first patterned conductive layer having gaps, the first patterned conductive layer comprising a first conductive feature (col. 1, lines 45-51 and col. 2, line 9); depositing a dielectric gap fill layer to fill the gaps (col. 1, lines 52-59); depositing a second dielectric layer on the first patterned conductive layer (col. 1, lines 62-64). Furthermore, Kepler discloses the formation of a photoresist mask (col. 1, lines 34-37) and the formation of a through-hole or via in the second dielectric layer exposing the upper surface of the first conductive feature.

Kepler does not disclose removing the photoresist mask and cleaning the through hole with a plasma containing CF₄ and H₂O.

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Solis discloses a process for forming via contact holes, including a step of removing the photoresist with a plasma comprising CF₄ and H₂O (col. 2, lines 45-64).

It is the Examiner's position that it would have been obvious to one skilled in the art at the time of the invention to modify Kepler by removing the photoresist layer with a plasma comprising CF₄ and H₂O, as per Solis, because, as stated by Solis, "an etch gas mixture comprising CF₄ and H₂O exhibits very aggressive ashrate of photoresist" (col. 2, lines 6-9), which is very desirable during semiconductor manufacturing.

In regard to claims 2, 4-11 and 15-20, it is the Examiner's position that the variation of process parameters is obvious to one skilled in the art with the purpose of establishing the best process mode.

In regard to claim 3, Kepler discloses the use of HSQ (col. 2, lines 60-67).

In regard to claim 13, Kepler discloses the formation of borderless vias (col. 9, lines 5 and 64).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Perez-Ramos whose telephone number is 703-306-5510. The examiner can normally be reached on Mon-Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7718 for regular communications and 703-305-3599 for After Final communications.

Application/Control Number: 09/498,336

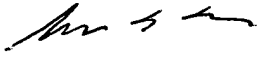
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5665.

Vanessa Perez-Ramos
Examiner
Art Unit 1765

VPR
March 21, 2001



BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700